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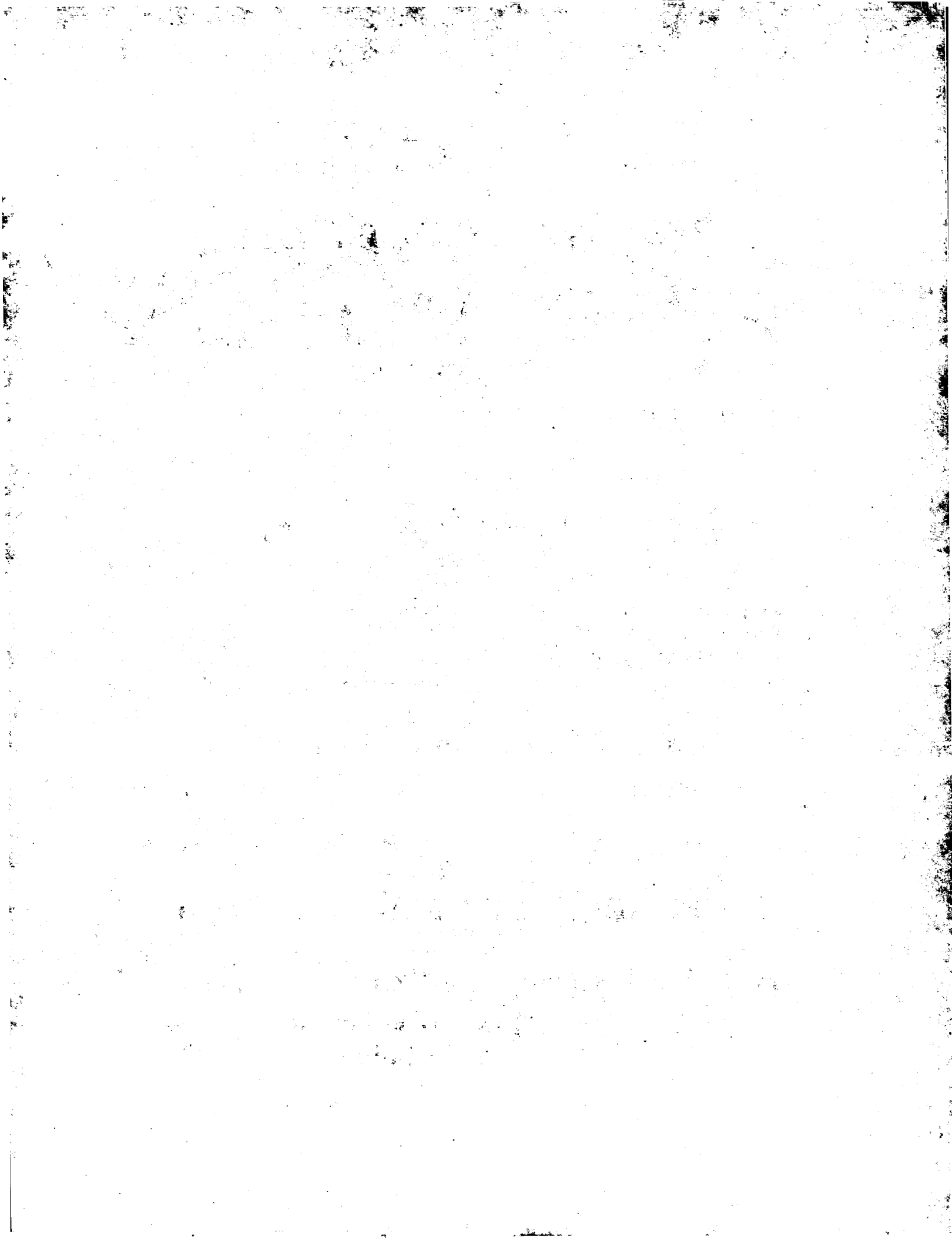
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PATENT SPECIFICATION

DRAWINGS ATTACHED

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Int. Cl.:—B 65 d 5/00

COMPLETE SPECIFICATION

Storage and Transportable Bag or like Container

We, THOMAS GUNNARD PETERSON and JOHN LATHAM HALL, citizens of the United States of America, of 1614 South West Evans, and 1512 Linden Lane, respectively, City of Des Moines, County of Polk, State of Iowa, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

Particular difficulty is encountered in transporting and storing powdered or granular materials and similar problems are encountered even in the storage and transporting of fluid materials. The granular materials must either be transferred from a storage container to a transportable bag or the like and thence back to a storage container after transportation, or they must be originally placed in a container and kept there throughout storage and transportation until the time of use. Fluid chemicals and the like are also often handled in this same way.

The difficulty encountered by such a storage and transportable containers involves the handling thereof as they are being deposited on and removed from the transportation device. Usually, cumbersome pallets or the like are used to facilitate the loading and unloading of these containers by conventional lifting apparatus. These containers many times do not economically and efficiently utilise the storage space and often consume valuable space when in an empty condition. Furthermore, they are either a permanent or disposable construction but cannot be easily adapted for both uses. These containers are usually designed to carry a specific load and cannot be reinforced to carry an increased load.

The invention consists in a storage and transportable container of multi-ply construction wherein the container is made of a unitary expansible first sheet providing a bottom portion and side forming portions having end

edges folded inwardly and secured in overlapping engagement and of a second unitary sheet secured against the first sheet and having end portions folded progressively and inwardly upon one another in reinforcing relation to the bottom and side forming portions of the first sheet and defining integral loops which project above the top portions of the first sheet and serve as carrying loops.

Reference will now be made to the accompanying drawings, in which:

Figure 1 is a perspective view of an empty container of this invention as it is being picked up by conventional lifting apparatus;

Figure 2 is a perspective view of a filled and sealed container of this invention but having an alternative design;

Figure 3 is a side elevational view of the container of this invention in a collapsed and empty condition;

Figure 4 is a perspective view of one of the sheet elements in the container during one stage of its fabrication;

Figure 5 is a partial perspective view of the container of this invention with portions thereof cut away to more fully illustrate its construction;

Figure 6 is a perspective view of a second sheet used in the container of this invention in one stage of its fabrication;

Figure 7 is a sectional view of the second sheet used in the container of this invention taken on line 7—7 of Figure 6;

Figure 8 is a partial perspective view of a liner element which can be used in or outside the container of this invention;

Figure 9 is a vertical sectional view taken through a container of this invention wherein the liner of Figure 8 is mounted therein;

Figure 10 is a perspective view of a moisture impervious bag which can be inserted into the container of this invention.

Figure 11 is a vertical sectional view taken through the container of this invention wherein the bag of Figure 10 is inserted therein;

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Figure 12 is a partial sectional view of the bottom of a container of this invention as taken on line 12—12 of Figure 5; and

5 Figure 13 is a sectional view similar to that of Figure 12 but shows an alternative form of construction at the bottom of the container.

The numeral 10 designates a first sheet of material used in the container of this invention and sheet 10 is best illustrated in Figure 4. 10 Sheet 10 is a reinforced laminated Kraft sheet of either asphalt latex or polyethylene construction. A characteristic of this material is that, while being very durable, it is expansible and does have limited elastic characteristics. 15 The container constructed from sheet 10, which will be described in more detail hereinafter, is capable of expanding in volume approximately 20 per cent when it is filled. Thus, the volume of a filled container in Figure 20 2 is substantially 20 per cent greater than the volume of the empty container in Figure 1. Sheet 10 includes a top portion 12, a bottom portion 14, and side forming portions having end edges 16 and 18. As best illustrated in 25 Figures 1 and 4, the end edges 16 and 18 can be placed in overlapping condition, and can be secured in this position by a suitable adhesive. A container bottom 20 (Figure 5 is comprised by folding the bottom portion 30 12 upon itself, such as by utilising the fold lines 20a as depicted in Figure 4. Obviously, the precise fold lines used in creating the container bottom 20 are not critical except as hereinafter noted. Similarly, a container top 35 22 (Figure 2) can be created by utilising fold lines such as lines 22a which are indicated in Figure 4. Again, the precise fold lines used are not critical and could assume a variety of patterns.

40 A second sheet 26 is best illustrated in Figure 6. Sheet 26 is preferably identical in material to sheet 10. This second sheet has been shown to be of two-ply construction, although the layers thereof can be varied as 45 desired, as with sheet 10. Sheet 26 includes a center portion 28 and end portions 30 and 32. Each end portion 30 and 32 has oppositely disposed flaps 34 and 36 which are folded progressively and diagonally inwardly from a point beginning at the center portion 28 and 50 extending to the inner ends 38. The flaps 34 and 36 are held in their folded condition by applying a suitable adhesive to the overlapping layers thereof.

55 After the end portions 30 and 32 of sheet 28 have been folded in the manner described above, and the flaps 34 and 36 have been secured in place by a suitable adhesive, the end portions are folded at 40 and doubled 60 over upon themselves as illustrated in Figure 6. These folds present loops 42 which will be used as described hereafter. In the assembled container loops 42 extend above the top portions 12 of the container first sheet to protect the container first sheet from the lifting 65

apparatus. Again, the loops 42 are maintained by applying adhesive to the overlapping folded portions of the sheet 26 except in the areas of loops 42. The extreme inner ends 38 of the end portions 30 and 32 are preferably 70 secured by adhesive to the center portion 28.

The size and shape of the center portion 28 of sheet 26 is substantially the same as the size and shape of the container bottom 20 as formed in sheet 10. The container bot- 75 tom 20 of sheet 10 is positioned on top of the center portion 28 of sheet 26 and the end portions 30 and 32 of sheet 26 are folded upwardly and are secured by a suitable adhesive to the outer side walls of the container 80 formed by the sheet 10. Normally, no adhesive is used between the container bottom 20 and the center portion 28 of sheet 26 and it is preferred that a recessed passageway 44 85 (Figure 12) be formed therebetween. A circular discharge opening 46 can be precut into container bottom 20 and a registering discharge opening 48 can be similarly cut in the center portion 28 of sheet 26. A rectangular baffle plate 50 of paper, metal, or plastics 90 construction can be slidably inserted into the recessed passageway 44 for a purpose to be described hereafter.

A container bottom is illustrated in Figure 13 which does not utilise the recessed passage- 95 way 44. In Figure 13, the container bottom 20 is in direct engagement with the center portion 28 of sheet 26 and the baffle plate 50a rests on top of the upper surface of the container bottom 20. 100

A flexible liner element 52 is shown in Figures 8 and 9. This liner element is preferably of the same material as sheets 10 and 26 and can be made to assume its rectangular 105 construction in the same manner that sheet 10 assumed this shape. It will be noted that liner 52 is open at both its upper and lower ends. Liner 52 is adapted to be inserted into the compartment formed by the folded sheet 10 (Figure 9) to serve to reinforce the side 110 walls of the container when unusually heavy loads are imposed on the container.

A flexible moisture impervious bag 54 is shown in Figures 10 and 11. Bag 54 is comprised of any convenient moisture resistant 115 material such as plastics or the like. It should have a volume equal to or greater than the internal volume of the container as formed by the folded sheet 10.

The folded condition of a container created 120 by uniting the sheets 10 and 26 in the manner described above is shown in Figure 3. It should be noted that it is not absolutely essential that the discharge openings 46 and 48 be created before the container is filled with mat- 125 erial, for in some uses, it is desirable to have the bottom of the container of continuous construction as generally depicted in Figures 9 and 11. If the container bottom is not of 130 continuous construction, but assumes the de-

sign of Figures 12 or 13, the baffle plates 50 or 50a are positioned as described to close off the discharge openings prior to the time that material is placed within the container.

- 5 After the container has been filled with the desired material, the top portion 12 of sheet 10 can be folded in the manner described to form a container top 22. The container top 22 can be sealed in a closed condition by utilising any convenient sealing tape 62 as depicted in Figure 2.

- 10 A lifting machine with horizontal parallel spaced apart arms 58 with tapered outer ends 60 is adapted to move towards the filled container so that the arms 58 can penetrate the open loops 42 of the container. The container can then be lifted and moved to any desired position such as within a transportation unit. Because the material of the container is somewhat elastic, the container will expand to hold a greater volume than the empty volume of the unit. Since loops 42 are flexible and extend above the top of the unit, they can be moved to receive the arms 58 of loader 56, even if the expansion of the unit has "spread" the normal position of the loops away from the arms 58. The arms 58 are removed from the loops 42 by merely reversing the above described process whereby the container was originally lifted. When the container is transported, such as by railroad car or the like, it can be subsequently removed from the transporting unit by a similar lifting apparatus 56.

- 35 If it is desired to increase the strength of the side walls of the container, the liner 52 can be inserted within the container before the material.

- 40 When it is desired to protect the material within the container from the effects of moisture, the bag 54 can be placed within the container and the top thereof can be sealed by any convenient manner after the material has been placed within the bag.

- 45 When it is desired to remove the contents from the container, the procedure involved will be dictated by the precise construction of the bottom of the container. If the bottom of the container is of continuous construction, as illustrated in Figures 9 and 11, the bottom or side of the container can be cut or punctured as the container is held in an elevated position to permit the contents of the container to move therefrom by gravity. Usually, a bag so punctured would be thrown away after the contents were removed therefrom.

- 55 When a container utilising the bottom construction shown in Figure 13 was being emptied, the baffle plate 50a would be punctured at a point just above the registering discharge openings 46 and 48 to permit the contents of the container to flow through these discharge openings. In such a case, the baffle plate 50a would normally be comprised of a heavy paper or the like. Again, the use of the discharge openings 46 or 48 presupposes

that the container is being held in an elevated position or that the container is supported on a pallet having a centrally located discharge opening. Such a container could be reused after opening by merely replacing the baffle plate 50a.

To empty the container shown in Figures 5 and 12, the baffle plate 50 is merely removed from the recessed passageway 44 and the material will flow by gravity through the discharge openings 46 and 48. These containers could be reused by merely reinserting the baffle plate 50 into the recessed passageway after the containers were emptied.

WHAT WE CLAIM IS:—

1. A storage and transportable container of multiply construction wherein the container is made of a unitary expansible first sheet providing a bottom portion and side forming portions having end edges folded inwardly and secured in overlapping engagement and of a second unitary sheet secured against the first sheet and having end portions folded progressively and inwardly upon one another in reinforcing relation to the bottom and side forming portions of the first sheet and defining integral loops which project above the top portions of the first sheet and serve as carrying loops.
2. A container as claimed in claim 1 wherein sheet portions defining the container bottom have registered openings normally closed by a baffle which is removable to permit the contained material to discharge through the openings.
3. A container according to claim 1 or 2 wherein the second sheet is at least partially folded upon itself in a lateral direction to increase its strength.
4. A container according to claim 1, 2 or 3 wherein the top portion of the first sheet is folded upon itself to form a closable container top.
5. A container according to any one of claims 1 to 4 wherein a bag of thin moisture impervious material is disposed within the container.
6. A container according to claim 5 wherein the bag has a volume at least as great as the internal volume of the container.
7. A container according to claim 5, wherein the bag has a volume greater than the internal volume of the said container.
8. A container according to any one of claims 1 to 7, wherein the end portions of the second sheet terminate adjacent the container bottom.
9. A container according to any one of claims 1 to 8, wherein the end portions of the second sheet terminate underneath the container bottom.
10. A container according to any one of claims 1 to 9, wherein the center portion of the second sheet has an area substantially the same as that of the container bottom.
11. A container according to claim 10,

- 4 wherein the end portions of the second sheet are folded laterally and diagonally inwardly so that at least part of the uppermost portions of the loop portions have a thickness twice that of the center portion.
- 5 12. A container according to any one of claims 1 to 11, wherein the bottom portion is held in its folded condition by an adhesive securing together overlapping portions thereof, and said loop portions being secured to the first sheet by an adhesive.
- 10 13. A container according to any one of claims 1 to 12, wherein a liner element having an open top and open bottom is removably positioned around the exterior of the container adjacent the first sheet and the loop portion. 15
14. A storage and transportable container substantially as hereinbefore described and illustrated in the accompanying drawings.

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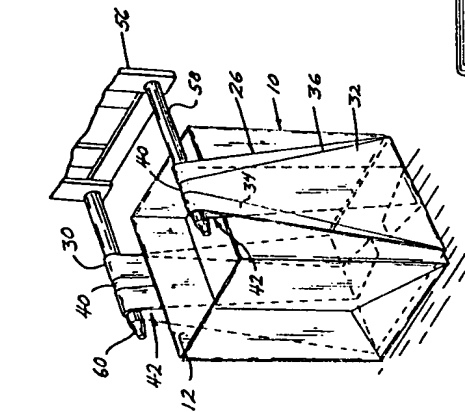


Fig. 1

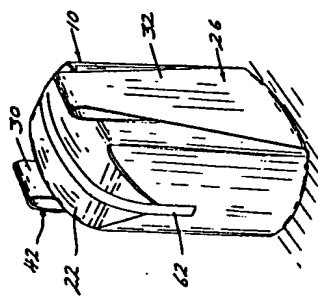


Fig. 2

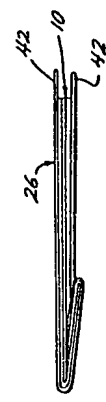


Fig. 3

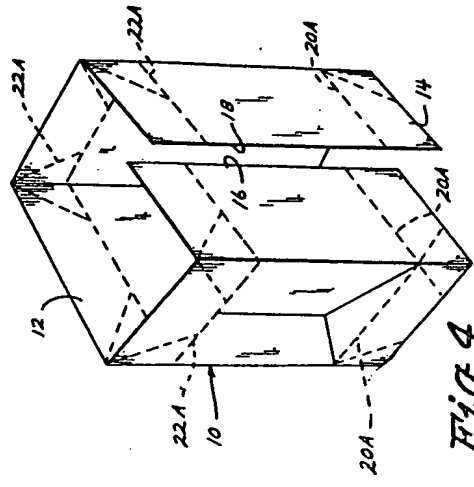


Fig. 4

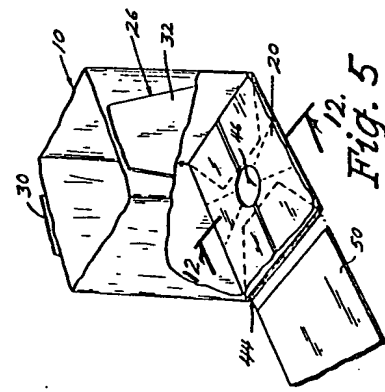


Fig. 5

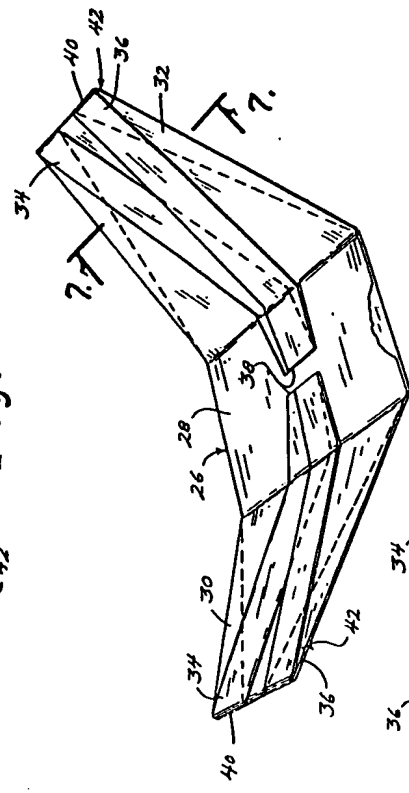


Fig. 6



Fig. 7

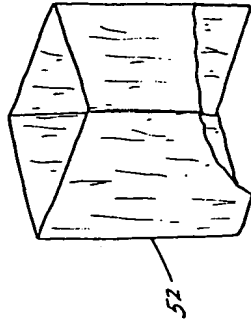


Fig. 8

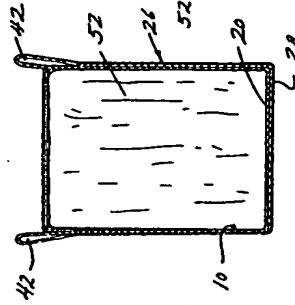


Fig. 9

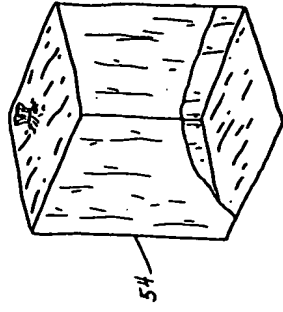


Fig. 10

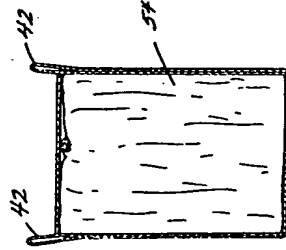


Fig. 11

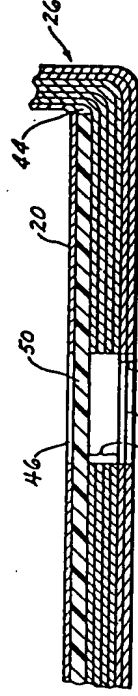


Fig. 12

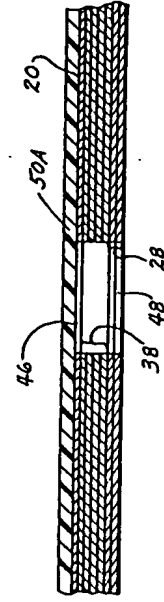


Fig. 13

